



InfantSEE: A Public Health Effort to Provide Comprehensive Vision Assessments to Infants

Mark Schwartz, MPH

Optometry's Charity™, The AOA Foundation, St. Louis, MO

Glen T. Steele, OD FCOVD

Chief of Pediatric Service, Southern College of Optometry, Memphis, TN

Norma K. Bowyer, OD, MS, MPH, FAAO

President, Society of Primary Care Policy Fellows, Morgantown, WV

Pamela Lowe, OD, FAAO

Professional Eye Care Center, Inc., Niles, IL

Walter Morton, OD

BuckEye Vision Care, Centennial, CO

James Spangler, OD

Independent Optometrist, Warren, PA

Abstract

Data collected by the American Optometric Association (AOA) via 10,000 InfantSEE® assessments conducted during 2006 and 2007, indicated the overall need for vision concern has increased from one in 14 in 2005 to one in nine in 2007. This finding reveals a growing need for early vision examinations in infants. The data also identified two groups at greatest risk for abnormal vision status: premature and minority babies.

Through InfantSEE®, participating optometrists provide a one-time, comprehensive eye and vision assessment to infants in their first year of life, between the ages of 6 and 12 months, offering early detection of potential eye and vision problems at no cost regardless of income or access to insurance coverage. InfantSEE® addresses the ways in which providing comprehensive vision assessments will ensure that the infants' vision health is developing properly. Furthermore, this project seeks to make a concentrated effort to address the two identified groups at greatest risk of abnormal status. In addition, the InfantSEE® program seeks to address these priority populations with a variety of health education tools.

Using various social marketing tools to address health education and promotion, one goal of the InfantSEE® program is to gain further knowledge about what means these identified high risk populations use to take advantage of a collaborative program such as InfantSEE®. Additionally, the program provides needed comprehensive vision assessments for infants to ensure healthy vision development and reassurance for mothers, while providing a public health program for infants across the country.

Methodology

Eight diverse geographic and socioeconomic locations across the country were chosen to measure the impact of increased advertising of the InfantSEE® program in a targeted area. Utilizing various social marketing and networking tools the impact of advance notice was measured to evaluate if increased awareness of the InfantSEE® program increases the number of infants seen by InfantSEE® providers. In all of the project locations, individuals were directed to make appointments at participating InfantSEE® providers' offices. In two of the eight locations, a mobile eye clinic was used for walk-up appointments in addition to scheduled in-office appointments. Advance demographic research was conducted to evaluate media outlets that would provide the greatest amount of awareness to the target audience. The identified target population consisted of mother ages 18-35 years of age who lived within a 10 mile radius of the closest InfantSEE® provider.

Baseline data was obtained from participating InfantSEE® providers to assess the current number of InfantSEE® exams conducted prior to the activated project area. Numerical comparisons examined the number of exams conducted during the project time frame as compared to baseline examinations conducted for the same time period one year earlier. Survey data was obtained from parents/guardians of infants receiving an InfantSEE® exam as part of the Centers for Disease Control and Prevention-funded 2009 InfantSEE® project. Each parent/guardian completed a parent survey pre- and post-InfantSEE® examination and returned to the InfantSEE® provider prior to leaving the office. Survey questions asked demographic information as well as attitudes about infant vision and general vision questions. Once completed, the surveys were stapled to the exam record form and returned to the InfantSEE® office at the end of each project week for four consecutive weeks. Data was entered into a Microsoft Access Database and later analyzed for significance and exploration of modes of discovery. Follow-up InfantSEE® provider surveys were also administered after the project week to gauge activity level and attitudes regarding the overall project experience.

Statistical analysis was completed by an independent university. T-tests, FREQ as well as linear regression and statistical modeling analysis were used to analyze the data.

Chi-square analysis of contingency tables were used. For example, an association between minority status and ocular health was found: 79.1% of Non-Caucasians had an ocular health problem, while only 3.40% of Caucasians had an ocular health problem. Pearson Chi-square = 8.9201, 1 degree of freedom, P-value = 0.0028.

Student's t-tests, both regular and Satterthwaite (unequal variance) were used. For example, those with ocular health problems were seen at an earlier average age, 8.67 months, than those without ocular health problems, average age = 10.25 months. Unequal variance $t = 3.94$, 61 degrees of freedom, $P\text{-value} = 0.0002$. (Those with ocular health problems had smaller variation in age, $SD = 2.51$ months vs. 4.47 months.)

Logistic regression was used to explore relationships for intermediary explanatory variables. For example, does income explain the minority vs. ocular health relationship described above? No, minority status remains statistically significant, and income (median income of zip code) is not significant.

Results

There were 1,051 exams performed in the outreach efforts. There were 536 females (50.9%) and 515 males (50.1%) in this population. Additionally, of the 1,051 infants, 145 of those infants were born prematurely (born prior to 36 weeks of gestation) and 280 infants reported non-Caucasian background. Of the 1,051 exams, 180 exams demonstrated a cause for concern (**one in six**). Results from this project population indicate a higher rate of cause for concerns than previously reported. Median household income for this project was \$36,000. The mean distance that an individual travelled for an InfantSEE® exam was 12 miles or 17 minutes.

Clinical Results

- The rate of causes for concern in this project population was: **one in six**.
- Premature infants (born prior to 36 weeks of gestation) and infants of minority background have a higher rate of concern: **one in four**.
- Premature Caucasian infants display 3 times greater risk for ocular health issues than other infants in this project population.
- Household income may play a role in overall vision health in infants. Median Income for this project is \$36,000.
 - Of all infants receiving an exam in this project with reported household under \$36,000, the rate for causes for concern is **one in four**.
 - Of all infants receiving an exam in this project with reported household over \$36,000, the rate for causes for concern is **one in six**.

• Three areas: ocular motility, visual acuity and binocularity display higher rates of cause for concern in households with lower household income.

• Significant causes for concern included: amblyogenic factors, hyperopia, esotropia, exotropia, strabismus and other vision issues.

Outreach Results

An effective combination of advance advertising in conjunction with social marketing provided unprecedented results for this project. Various social networking campaigns that involved mommy bloggers and online advertising were effective. However, the most effective tool used was the direct mail piece in conjunction with a mobile clinic outreach strategy. This combination produced considerably more exams than the six other locations, which did not incorporate the mobile clinic strategy.

According to the collected parent survey of the 1,051 infants receiving an examination in this project, direct mailing, TV, radio, newspaper and word of mouth were the top five modes of discovery for the InfantSEE® week project. Social networks play an important role in the dissemination of public health programs, however, in this experience, direct mail pieces in conjunction with mobile clinic outreach provided for the greatest impact to the number of infants seen as a result of advance advertising. Ultimately, a broad, diverse mixture involving social networking, advance advertising and mobile clinic outreach provided for great success in a pediatric vision public health program.

The mobile clinic effort displayed significant success in relation to the number of infants being seen by the program. At the same time, the mobile clinic provides a convenient and trusted outreach strategy for the program.

Conclusions

Clinically, the rate of cause for concern has significantly increased from previous studies as reported in this project population. Premature infants (born prior to 36 weeks of gestation) and infants from minority backgrounds are at higher rates of causes for concern than other infants within this population. Household income may play a significant role in the prevalence of ocular issues in three distinct categories: ocular motility, visual acuity and binocularity.

Social networking, in conjunction with a diverse media advertising campaign and mobile clinic outreach strategy work in the promotion of a pediatric public health program. The opportunity to partner with community resources such as Maternal and Child Health Agencies help to expand the reach of the InfantSEE® program. Furthermore, pediatric public health programs play a vital role in the early identification and promotion of infant vision health in this format. Further exploration should be conducted in other diverse locations to examine the clinical significance of infant vision health in this country.

In conclusion, further examination is needed to assess the current situation of infant vision health in this country. Additional research is needed to examine and assess the relationship household income plays in the vision health of infants in this country.

Acknowledgements

The 2009 InfantSEE® project was funded by the Centers for Disease Control and Prevention Grant # 1H75DD000472-01. The InfantSEE® program would like to thank the InfantSEE® providers, staff and State Optometric Associations who participated in this project. InfantSEE® would also like to thank Washington University and in particular, Dr. Edward Spitznagel for his statistical analysis for this project.

For More Information

For information about the InfantSEE® program, please contact Mark Schwartz, MPH at maschwartz@aoa.org or visit www.infantsee.org.

